General

Guideline Title

Cardiac disease evaluation and management among kidney and liver transplantation candidates. A scientific statement from the American Heart Association and the American College of Cardiology Foundation.

Bibliographic Source(s)

Lentine KL, Costa SP, Weir MR, Robb JF, Fleisher LA, Kasiske BL, Carithers RL, Ragosta M, Bolton K, Auerbach AD, Eagle KA, American Heart Association Council on the Kidney in Cardiovascular Disease and. Cardiac disease evaluation and management among kidney and liver transplantation candidates: a scientific statement from the American Heart Association and the American College of Cardiology Foundation. J Am Coll Cardiol. 2012 Jul 31;60(5):434-80. [298 references] PubMed

Lentine KL, Costa SP, Weir MR, Robb JF, Fleisher LA, Kasiske BL, Carithers RL, Ragosta M, Bolton K, Auerbach AD, Eagle KA, on behalf of the American Heart Association Council on the Kidney in. Cardiac disease evaluation and management among kidney and liver transplantation candidates: a scientific statement from the American Heart Association and the American College of Cardiology Foundation. Circulation. 2012 Jul 31;126(5):617-63. [298 references] PubMed

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Message from the Guideline Developers: The American College of Cardiology, American Heart Association, and the European Society of Cardiology are all in the process of completing updated versions of our Guidelines for Perioperative Care. Our respective writing committees are undertaking a careful analysis of all relevant validated studies and always incorporate appropriate new trials and meta-analyses into our evidence review. In the interim, our current joint position is that the initiation of beta blockers in patients who will undergo non-cardiac surgery should not be considered routine, but should be considered carefully by each patient's treating physician on a case-by-case basis. Please see the expression of concern which is free to view in Eur Heart J (2013) 34 (44): 3460; doi: 10.1093/eurheartj/eht431.

Definitions for the Evidence Level (A-C) and Class of Recommendation (I-III) are provided at the end of the "Major Recommendations" field.

Determining Whether the Transplantation Candidate Has an Active Cardiac Condition

Recommendation

1. A thorough history and physical examination are recommended to identify active cardiac conditions before solid-organ transplantation (Class I; Level of Evidence C).

Summary and Recommendations Regarding Noninvasive Stress Testing in Kidney Transplantation Candidates without Active Cardiac Conditions

Recommendation

1. Noninvasive stress testing may be considered in kidney transplantation candidates with no active cardiac conditions based on the presence of multiple coronary artery disease (CAD) risk factors regardless of functional status. Relevant risk factors among transplantation candidates include diabetes mellitus, prior cardiovascular disease, more than 1 year on dialysis, left ventricular hypertrophy, age greater than 60 years, smoking, hypertension, and dyslipidemia. The specific number of risk factors that should be used to prompt testing remains to be determined, but the committee considers 3 or more as reasonable (Class IIb; Level of Evidence C).

Cardiac Surveillance after Listing for Transplantation

Recommendation

1. The usefulness of periodically screening asymptomatic kidney transplantation candidates for myocardial ischemia while on the transplant waiting list to reduce the risk of major adverse cardiovascular events (MACEs) is uncertain (Class IIb; Level of Evidence C).

Supplemental Testing

Evidence for Resting Echocardiography in Kidney Transplantation Candidates

Recommendation

1. It is reasonable to perform preoperative assessment of left ventricular function by echocardiography in potential kidney transplantation candidates (Class IIa; Level of Evidence B). There is no evidence for or against surveillance by repeated left ventricular function tests after listing for kidney transplantation.

Valve Disease

Recommendation

1. It may be reasonable to consider end-stage renal disease (ESRD) patients with moderate aortic stenosis to be equivalent to demonstrated "rapid progressors" who warrant a yearly echocardiogram and monitoring for early symptoms (Class IIb; Level of Evidence C).

Pulmonary Hypertension

Recommendations

1. It is reasonable to evaluate kidney transplantation candidates with echocardiographic evidence of significant pulmonary hypertension for underlying causes (e.g., obstructive sleep apnea, left heart disease) (Class IIa; Level of Evidence C).
2. It may be reasonable to confirm echocardiographic evidence of elevated pulmonary arterial pressures in kidney transplantation candidates by right heart catheterization (Class IIb; Level of Evidence C). Echocardiographic evidence of significant pulmonary hypertension in this population is defined by right ventricular systolic pressure more than 45 mm Hg or ancillary evidence of right ventricular pressure overload.
3. If right heart catheterization confirms the presence of significant pulmonary arterial hypertension (as defined by mean pulmonary artery pressure ≥25 mm Hg, pulmonary capillary wedge ≤15 mm Hg, and pulmonary vascular resistance of >3 Wood units) in the absence of an identified secondary cause (e.g., obstructive sleep apnea, left heart disease), referral to a consultant with expertise in pulmonary arterial hypertension management and advanced vasodilator therapies is reasonable (Class IIa; Level of Evidence C).

Evidence for Preoperative 12-Lead Electrocardiogram (ECG) in Kidney Transplantation Candidates

Recommendations

1. A preoperative resting 12-lead ECG is recommended for potential kidney transplantation candidates with known coronary heart disease, known peripheral arterial disease, or any cardiovascular symptoms (Class I; Level of Evidence C).
2. A preoperative resting 12-lead ECG is reasonable in potential kidney transplantation candidates without known cardiovascular disease (Class IIa; Level of Evidence C).
3. Annual performance of 12-lead ECG after listing for kidney transplantation may be reasonable (Class IIb; Level of Evidence C).

Biomarkers as Tools for Cardiac Evaluation in Kidney Transplantation Candidates

Recommendation

1. Measurement of cardiac troponin T (cTnT) level at the time of evaluation for kidney transplantation may be considered an additional prognostic marker (Class IIb; Level of Evidence B).

Evidence for Cardiac Computed Tomography (CT) in Kidney Transplantation Candidates

Recommendation

1. The usefulness of noncontrast CT calcium scoring and cardiac CT angiography is uncertain for the assessment of pretransplantation cardiovascular risk (Class IIb; Level of Evidence B).

Recommendations for Referral to a Cardiologist

Recommendations

1. Referral criteria: Kidney transplantation candidates who have a left ventricular ejection fraction (LVEF) less than 50%, evidence of ischemic left ventricular dilation, exercise-induced hypotension, angina, or demonstrable ischemia in the distribution of multiple coronary arteries should be referred to a cardiologist for evaluation and long-term management according to American College of Cardiology (ACC)/American Heart Association (AHA) guidelines for the general population (Class I; Level of Evidence B).
2. Coordination of care: It may be reasonable for each program to identify a primary cardiology consultant for questions related to potential kidney transplantation candidates (Class IIb; Level of Evidence C).

Recommendations for Coronary Revascularization and Related Care before Kidney Transplantation

Recommendations

1. Coronary revascularization before transplantation surgery should be considered in patients who meet the criteria outlined in the *2011 ACCF/AHA Guidelines for Coronary Artery Bypass Graft Surgery* (Class I; Level of Evidence B). It is recognized that in some asymptomatic transplantation candidates, the risk of coronary revascularization may outweigh the risk of transplantation and these risks must be weighed by the multidisciplinary transplantation team on a case-by-case basis until further studies are performed in this population.
2. Coronary artery bypass grafting (CABG) is probably recommended in preference to percutaneous coronary intervention (PCI) to improve survival in patients with multivessel CAD and diabetes mellitus (Class IIa; Level of Evidence B).
3. CABG to improve survival and/or to relieve angina despite optimal medical therapy may be reasonable for patients with ESRD with significant (>50%) left main stenosis or significant (≥70%) stenoses in three major vessels or in the proximal left anterior descending artery plus one other major vessel, regardless of left ventricular systolic function (Class IIb; Level of Evidence B).
4. It is not recommended that routine prophylactic coronary revascularization be performed in patients with stable CAD, absent symptomatic or survival indications, before transplantation surgery (Class III; Level of Evidence B).

Recommendations for PCI and Duration of Thienopyridine Therapy before Kidney Transplantation

Recommendations

1. In patients in whom coronary revascularization with PCI is appropriate for mitigation of cardiac symptoms and who need transplantation surgery in the subsequent 12 months, a strategy of balloon angioplasty or bare-metal stent (BMS) placement followed by 4 to 12 weeks of dual antiplatelet therapy is probably indicated (Class IIa; Level of Evidence B).
2. In patients who have received a drug-eluting stent (DES) and who must undergo urgent surgical procedures that mandate the discontinuation of thienopyridine therapy, it is reasonable to continue aspirin if at all possible and to restart the thienopyridine as soon as possible (Class IIa; Level of Evidence C).
3. In cases when urgent surgery must be performed in patients taking aspirin and thienopyridines after coronary stent placement and who are at high risk for bleeding complications, a strategy of stopping the thienopyridine 5 days before surgery and continuing aspirin perioperatively may be reasonable. The thienopyridine should be restarted as soon as possible postoperatively (Class IIb; Level of Evidence B).
4. It may be reasonable to perform kidney transplantation surgery without interruption of clopidogrel therapy if the risk of bleeding is low (Class IIb; Level of Evidence C).
5. Transplantation surgery within 3 months of BMS placement and within 12 months of DES placement is not recommended, particularly if the anticipated time of poststent dual antiplatelet therapy will be shortened (Class III; Level of Evidence B).
6. Transplantation surgery is not recommended within 4 weeks of coronary revascularization with balloon angioplasty (Class III; Level of Evidence B).

Preoperative Cardiovascular Risk Factor Modification in Renal Transplantation Candidates

Lipid Management in Kidney Transplantation Candidates

Recommendation

1. It may be reasonable to administer statins to kidney transplantation candidates to reduce the risk of vascular disease events (Class IIb; Level of Evidence B).

Perioperative Medical Management of Cardiovascular Risk before Kidney Transplantation

Recommendations

1. Among patients already taking beta-adrenergic blockers before renal transplantation, continuing the medication perioperatively and postoperatively is recommended to prevent rebound hypertension and tachycardia (Class I; Level of Evidence A).
2. Among patients being considered for renal transplantation with clinical markers of cardiac risk (diabetes mellitus, prior known coronary heart disease, prior heart failure, extracardiac atherosclerosis) and those with unequivocal myocardial ischemia on preoperative stress testing, it is reasonable to initiate beta-blockers preoperatively and to continue them postoperatively provided that dose titration is done carefully to avoid bradycardia and hypotension (Class IIa; Level of Evidence C).
3. Perioperative initiation of beta-blockers in beta-blocker–naive patients may be considered in kidney transplantation candidates with established coronary heart disease or two or more cardiovascular risk markers to protect against perioperative cardiovascular events if dosing is titrated and monitored (Class IIb; Level of Evidence C).
4. Initiating beta-blocker therapy in beta-blocker-naive patients the night before and/or the morning of noncardiac surgery is not recommended (Class III; Level of Evidence A).

Recommendation

1. Administration of dopamine to the kidney transplant recipient is not beneficial for renal allograft function, and administration may be harmful (Class III; Level of Evidence C).

Recommendation

1. It is reasonable to continue aspirin indefinitely after renal transplantation in patients with known CAD, following the ACC/AHA guidelines for secondary prevention for patients with coronary artery disease (Class IIa; Level of Evidence B).

Recommendations

1. For patients undergoing renal transplantation who are taking statin therapy, it is recommended that statin treatment be continued perioperatively and postoperatively (Class I; Level of Evidence B).
2. For patients undergoing renal transplantation in whom preoperative evaluation established unequivocal evidence of atherosclerosis, it is reasonable to initiate low- to moderate-dose statin therapy preoperatively and to continue treatment postoperatively (Class IIa; Level of Evidence B).

Recommendation

1. The usefulness of strict control of blood glucose concentration during the perioperative period is uncertain in patients with diabetes mellitus undergoing kidney transplantation (Class IIb; Level of Evidence B).

Postoperative Medical Management of Cardiovascular Risk after Kidney Transplantation

Treatment of Elevated LDL Cholesterol Levels in Kidney Transplant Recipients

Recommendation

1. Consistent with the recommendations of the National Kidney Foundation/Kidney Disease Outcomes Quality Initiative (NKF/KDOQI) Clinical Practice Guidelines for Managing Dyslipidemias in Kidney Transplant Patients it is reasonable to pursue a low density lipoprotein (LDL) cholesterol goal of less than 100 mg/dL in kidney transplant recipients without known CAD (Class IIa; Level of Evidence B).

Recommendations

1. When therapeutic lifestyle change alone is insufficient to achieve LDL goals, it is reasonable to initiate statin therapy in transplanted patients with LDL cholesterol levels above 100 mg/dL (Class IIa; Level of Evidence B).

2. Extrapolating from the Adult Treatment Panel III (ATP III) and NKF/KDOQI guidelines, it is reasonable to initiate therapy to reduce non-high density lipoprotein (HDL) cholesterol to less than 130 mg/dL among kidney transplant recipients with LDL less than 100 mg/dL, triglyceride levels above 200 mg/ dL, and non-HDL cholesterol above 130 mg/dL (Class IIa; Level of Evidence B).

Recommendations

1. Consistent with the NKF/KDOQI guidelines, for patients who do not achieve goals with statins, it is reasonable to discontinue the statin and replace it with a fibrate. As noted, the 2004 KDOQI guidelines stated that ezetimibe should probably not be used in the transplantation setting until its safety has been established (Class IIa; Level of Evidence C).
2. Consistent with NKF/KDOQI guidelines, given the risks of pharmacological therapy to raise HDL (in the absence of high LDL or high triglycerides), it is not recommended to initiate such therapy in patients with kidney disease (Class III; Level of Evidence B).
3. Lipid-lowering therapy specifically for the goals of preventing acute rejection or preserving allograft function is not recommended (Class III; Level of Evidence B).

Evaluation for CAD in Liver Transplantation Candidates

Recommendations

1. Noninvasive stress testing may be considered in liver transplantation candidates with no active cardiac conditions on the basis of the presence of multiple CAD risk factors regardless of functional status. Relevant risk factors among transplantation candidates include diabetes mellitus, prior cardiovascular disease, left ventricular hypertrophy, age greater than 60 years, smoking, hypertension, and dyslipidemia. The specific number of risk factors that should be used to prompt testing remains to be determined, but the committee considers three or more to be reasonable (Class IIb; Level of Evidence C).
2. It may be reasonable for each program to identify a primary cardiology consultant for questions related to potential liver transplantation candidates (Class IIb; Level of Evidence C).

Management of Flow-Limiting CAD in Liver Transplantation Candidates

Recommendation

1. Liver transplantation candidates who have an LVEF less than 50%, evidence of ischemic left ventricular dilation, exercise-induced hypotension, angina, or demonstrable ischemia in the distribution of multiple coronary arteries should be referred to a cardiologist for evaluation and long-term management according to ACC/AHA guidelines for the general population (Class I; Level of Evidence B).

Evaluation for Pulmonary Hypertension in Liver Transplantation Candidates

Recommendation

1. It is reasonable to perform resting echocardiography in patients who are potential liver transplant recipients for the purpose of identifying pulmonary hypertension and/or intrapulmonary arteriovenous shunt (Class IIa; Level of Evidence B).

Recommendation

1. If right heart catheterization confirms the presence of significant pulmonary arterial hypertension (as defined by mean pulmonary artery pressure ≥25 mm Hg, pulmonary capillary wedge ≤15 mm Hg, and pulmonary vascular resistance of >3 Wood units) in the absence of an identified secondary cause (e.g., obstructive sleep apnea, left heart disease), referral to a consultant with expertise in pulmonary arterial hypertension management and advanced vasodilator therapies is reasonable (Class IIb; Level of Evidence C).

Medical Management of Cardiovascular Risk in Liver Transplantation Candidates

Recommendation

1. It is reasonable to initiate nonselective beta-blockers in liver transplantation candidates with large esophageal varices (Class IIa; Level of Evidence B).

Definitions:

Class of Recommendation: Magnitude of Procedure/Treatment Effect

Class I Conditions for which there is evidence for and/or general agreement that the procedure/therapy is useful and effective

Class II Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of performing the procedure/therapy

Class IIa Weight of evidence/opinion is in favor of usefulness/efficacy

Class IIb Usefulness/efficacy is less well established by evidence/opinion

Class III Conditions for which there is evidence and/or general agreement that the procedure/therapy is not useful/effective and in some cases may be harmful

Evidence Level: Estimate of Certainty (Precision) of Procedure/Treatment Effect*

A Consistent direction and magnitude of effect from multiple randomized controlled clinical trials

B Consistent retrospective cohort, exploratory cohort, ecological, outcomes research, or case-control studies, or extrapolations from Level A studies

C Case-series studies or extrapolations from Level B studies

*A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Although randomized trials are not available, there may be a very clear consensus that a particular test or therapy is effective.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Cardiac disease

Note: Issues related specifically to the evaluation of carotid or peripheral vascular disease are beyond the scope of the guideline.

Guideline Category

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Screening

Treatment

Clinical Specialty

Cardiology

Endocrinology

Gastroenterology

Internal Medicine

Nephrology

Surgery

Intended Users

Physicians

Guideline Objective(s)

To provide recommendations regarding cardiac risk evaluation and management in kidney transplantation and liver transplantation candidates

Target Population

Candidates for kidney or liver transplantation

Interventions and Practices Considered

1. History and physical examination
2. Noninvasive stress testing in patients with coronary artery disease (CAD) risk factors
3. Supplemental testing
    - Resting echocardiography
    - Preoperative 12-lead electrocardiogram (ECG)
    - Cardiac computed tomography (CT)
    - Measurement of cardiac troponin T (cTnT) level
4. Referral to cardiologist
5. Coronary revascularization and related care
6. Medical management of cardiovascular risk, including blood pressure management, lipid-lowering therapy, lifestyle change, and evaluation for CAD

Major Outcomes Considered

- Predictive value of tests
- Risk/prevalence of coronary artery disease (CAD)
- Risk/prevalence of cardiovascular events
- Perioperative morbidity and mortality
- Survival
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The American Heart Association (AHA) Writing Committee on Cardiac Disease Evaluation and Management Among Kidney and Liver Transplantation Candidates conducted a comprehensive review of the literature relevant to perioperative cardiac evaluation of potential kidney or liver transplant recipients, including the prevalence of coronary artery disease (CAD) in these populations; incidence of major adverse cardiovascular events (MACEs) before and after transplantation; accuracy of clinical risk markers, symptoms, and noninvasive testing before and after transplant listing for detecting active cardiac conditions and CAD; and clinical outcomes of revascularization and the medical management of atherosclerosis.

Literature searches were conducted in the following databases: PubMed, MEDLINE, and the Cochrane Library (including the Cochrane Database of Systematic Reviews and the Cochrane Controlled Trials Register). Searches were limited to the English language, the years 1990 through March 2010, and human subjects. Related article searches were conducted in MEDLINE to find additional relevant articles. Finally, committee members recommended applicable articles outside the scope of the formal searches.

Number of Source Documents

350

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Evidence Level: Estimate of Certainty (Precision) of Procedure/Treatment Effect*

A Consistent direction and magnitude of effect from multiple randomized controlled clinical trials

B Consistent retrospective cohort, exploratory cohort, ecological, outcomes research, or case-control studies, or extrapolations from Level A studies

C Case-series studies or extrapolations from Level B studies

*A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Although randomized trials are not available, there may be a very clear consensus that a particular test or therapy is effective.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

This report evaluates the state of evidence regarding cardiac risk evaluation and management in kidney transplantation and liver transplantation candidates, considering data specific to these populations and the appropriateness of extrapolations when data from these populations are lacking.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The American Heart Association (AHA) Writing Committee on Cardiac Disease Evaluation and Management among Kidney and Liver Transplantation Candidates conducted a comprehensive review of the literature. Each section was assigned to a lead author and coauthor. Interval drafts were discussed during conference calls and two face-to-face meetings. Recommendations included an evaluation of the strength of the evidence for or against a particular procedure or treatment in terms of the magnitude of effect (evidence class) (see the "Rating Scheme for the Strength of the Recommendations" field) and estimate of certainty (evidence level) (see the "Rating Scheme for the Strength of the Evidence" field). Recommendations were subjected to formal, anonymous voting. The volume of text devoted to cardiac evaluation and management issues for kidney and liver transplantation candidates, respectively, reflects the relative sizes of the target populations; the number of patients awaiting and receiving kidney transplants is >4 times the number of patients awaiting and receiving liver allografts. Correspondingly, a substantially larger number of publications to date have addressed these issues for kidney compared with liver transplantation candidates.

Rating Scheme for the Strength of the Recommendations

Class of Recommendation: Magnitude of Procedure/Treatment Effect

Class I Conditions for which there is evidence for and/or general agreement that the procedure/therapy is useful and effective

Class II Conditions for which there is conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of performing the procedure/therapy

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Class III Conditions for which there is evidence and/or general agreement that the procedure/therapy is not useful/effective and in some cases may be harmful

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Expert peer review of American Heart Association (AHA) Scientific Statements is conducted by the AHA Office of Science Operations. The original guideline document was approved by the AHA Science Advisory and Coordinating Committee on October 11, 2011, and by the American College of Cardiology Foundation Board of Trustees on November 16, 2011.

Additionally, the document was reviewed by a group of external peer reviewers and by representatives of the American Society of Transplant Surgeons (ASTS), American Society of Transplantation (AST), and National Kidney Foundation (NKF).

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate evaluation and management of kidney and liver transplantation candidates to reduce the morbidity and mortality of cardiovascular disease

Potential Harms

- Any test used to screen a population is associated with false-positive and -negative results that may diminish utility. False-positive results in particular may lead to patient and physician anxiety and the possibility of additional and often unnecessary testing or invasive procedures.
- For organ transplantation, cardiac evaluation could be used to deny transplantation to high-risk patients, provided that it can be shown that patients with severe cardiovascular disease have sufficiently short life expectancy to make transplantation a poor use of scarce donated organs. However, studies have shown that survival is generally improved by transplantation compared with remaining on the transplant waiting list, even among high-risk patients.
- In patients having undergone percutaneous coronary intervention (PCI), the risk of stopping antiplatelet therapy should be weighed against the benefit of lowering the risk of bleeding complications from the planned surgery.
- The potential benefit of perioperative aspirin for prevention of cardiovascular disease events in patients with chronic kidney disease (CKD) must be offset by the risk of gastrointestinal bleeding, albeit minor in the majority of cases.
- Beta-blockers are recommended for those with a positive stress test undergoing major vascular surgery, although short-term administration without titration may be associated with harm.
- Cardiac catheterization may be performed despite coagulopathy in patients with end-stage liver disease (ESLD), although at increased risk of bleeding complications.
- Although glycemic control may offer a benefit in the perioperative setting, caution with intensive therapy is warranted.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jul 31

Guideline Developer(s)

American College of Cardiology Foundation - Medical Specialty Society

American Heart Association - Professional Association

Source(s) of Funding

American Heart Association and the American College of Cardiology Foundation

Guideline Committee

Writing Committee on Cardiac Disease Evaluation and Management Among Kidney and Liver Transplantation Candidates

Composition of Group That Authored the Guideline

Committee Members: Krista L. Lentine, MD, MS (*Co-Chair*); Salvatore P. Costa, MD (*Co-Chair*); Matthew R. Weir, MD, FAHA; John F. Robb, MD, FAHA; Lee A. Fleisher, MD, FAHA; Bertram L. Kasiske, MD; Robert L. Carithers, MD; Michael Ragosta, MD; Kline Bolton, MD; Andrew D. Auerbach, MD; Kim A. Eagle, MD, FAHA (*Chair*)

Financial Disclosures/Conflicts of Interest

The American Heart Association (AHA) and the American College of Cardiology Foundation (ACCF) make every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

See Appendices 1 and 2 in the original guideline document for a complete list of disclosures for the writing group and reviewers.

Guideline Endorser(s)

American Society of Transplant Surgeons - Professional Association

American Society of Transplantation - Professional Association

National Kidney Foundation - Disease Specific Society

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Circulation Web site and from the Journal of the American College of Cardiology Web site.

Print copies: Available from the American Heart Association, Public Information, 7272 Greenville Ave, Dallas, TX 75231-4596; Phone: 800-242-8721

Availability of Companion Documents

The following are available:

- Top ten things to know. Cardiac disease evaluation and management among kidney and liver transplantation candidates. Dallas (TX): American Heart Association (AHA); 2012. 1 p. Electronic copies: Available from the American Heart Association (AHA) Web site.
- deFillippi C. Bringing harmony to the cacophony of cardiovascular disease assessment for potential kidney liver transplant candidates. A case for assimilating the new AHA/ACCF guidelines. Commentary. 2012 Jul 2. Electronic copies: Available from the AHA Web site.
- Methodology manual and policies from the ACCF/AHA Task Force on Practice Guidelines. 2010 Jun. 88 p. Electronic copies: Available in Portable Document Format (PDF) from the AHA Web site.
- AHA statement and guideline development process. Dallas (TX): American Heart Association (AHA); 2009 Aug. 29 p. Electronic copies: Available in PDF from the AHA Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on September 13, 2012. The information was verified by the guideline developer on October 8, 2012. This summary was updated by ECRI Institute on July 10, 2014 to insert a message from the guideline developers on the use of beta blockers in perioperative care.

Copyright Statement

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